FACT SHEET

L-984

# PAINTING THE EXTERIOR WOOD OF YOUR HOME

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Painted wood siding and trim add color and beauty to the exterior home surface and preserve the clean and pleasing appearance of the home. Proper selection of lumber, plywood and paint, as well as proper surface preparation and finish application, will make this pleasing appearance last longer.

### Why Exterior Finishes Fail

The main problem associated with exterior wood finishing is the deterioration of the finish material. Paints often crack, blister or peel within a year or two; then the homeowner must spend many hours scraping and sanding before refinishing.

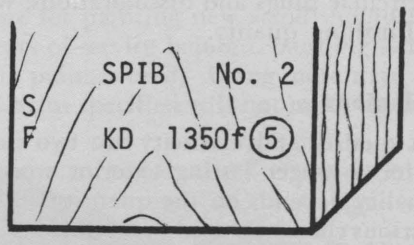
Finishes often fail because wood is a dimensionally unstable material. Wood continually takes up or gives off water, relative to the atmospheric moisture content, until equilibrium is achieved. This moisture exchange between wood and the atmosphere causes the wood to shrink and swell. Most finishes are not elastic enough to withstand this continual stress, so cracking and peeling occurs (Fig. 1). This type of finish failure accounts for most premature repainting. Thus, controlling wood instability and selecting paints with good elasticity are important.

### Wood Product Selection

Wood product quality influences the permanence of exterior finishes. Wood should have a proper moisture content to prevent shrinkage stress that can crack and peel paint films.

Softwood lumber and plywood used for exterior siding and trim should have a quality grade stamp to ensure quality and correct moisture content.

A typical grade stamp for southern yellow pine lumber looks like this:




The SF and SPIB mean the lumber has been manufactured in accordance with standards specified by the Southern Forest Products Asssociation and the Southern Pine Inspection Bureau, and that it is under periodic inspection by the SPIB. The No. 2 is the lumber grade; KD means it has been kiln dried; the 1350f is a strength rating; and the number 5 is a mill code. The KD is the important marking in regard to proper moisture content. Other markings you may find which relate to moisture content are "MC 15" and "S-DRY." If the grade stamp is "S-DRY," lumber 2 inches or less in thickness can't exceed 19 percent moisture content. If the grade stamp is "KD" (kiln dried) or "MC 15" (moisture content 15 percent), the maximum moisture content is restricted to 15 percent. Because lumber is dried to moisture contents that relate to regional average weather conditions, the moisture grade stamp markings assure that lumber, with proper use, will have limited shrinking and swelling.

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Softwood plywood also has quality grade stamps to assure the consumer that the product will finish properly. A typical grade stamp for exterior plywood siding would look like this:

| | |
|---|---|
| **A-C** | **TESTED** |
| **GROUP 1** | **DFPA** |
| **EXTERIOR** | **QUALITY** |

The A-C gives the plywood panel face grade (A) and the panel back grade (C). Group 1 is a strength classification; Exterior means the panel was bonded using 100 percent waterproof adhesive and can be used for siding and trim; and DFPA is an agency certification of quality which indicates the plywood has been subjected to the rigid testing and inspection program of the American Plywood Association. (For additional information on specifying and buying softwood plywood, obtain a copy of L-1224, *Guide for Specifying and Buying Softwood Plywood,* from your local county Extension agent.) Plywood appearance (face and back) grades are important to the consumer because they specify surface conditions and defects, such as knots, pitch streaks, circular plugs and discolorations, which influence finishing quality.

**Paint Selection**

Paint quality and elasticity are two important criteria for a longer lasting exterior wood finish. Paint quality depends on the quantity and quality of the various chemicals used to manufacture paints. Quality paints cost more, but this cost is usually small compared to the cost of labor. Using quality paints increases time between repaintings and reduces finishing costs.

Paint elasticity depends on the chemical used to form the finish film. This film must be able to withstand periodic wood surface shrinking and swelling. Oil-base paint films, which cure by oxidation, become brittle and crack when wood surfaces undergo dimensional changes. Grain cracking is a common failure in old oil paint films.

It is extremely important to prepare a new wood surface properly if oil-base paints are to be used. New wood treated with a water-repellent preservative (WRP) before painting is capable of repelling water; this reduces dimensional change. An oil-base paint's service life often can be doubled by a WRP pretreatment. This is discused in more detail below.

Latex type paints (emulsions of polymers or copolymers in water) are gaining popularity because of their good tint retention, easy application and easy cleanup with water. They usually have better elasticity than oil-base paints. Chemicals used to form water emulsions in latex paints are acrylics, vinyls and alkyds.

All-acrylic emulsion paints have been shown to perform well on southern yellow pine siding and trim. This type of wood has been almost impossible to paint successfully because of its extreme dimensional instability.

Tests conducted on inexpensive tract houses in the San Antonio area showed 100 percent acrylic paints to be superior to conventional oil-base paints. In other tests conducted jointly by the Southern Forest Products Association and the New Orleans School Board, acrylic paints didn't flake or crack after 5 years' exposure on southern yellow pine drop siding. In comparison, oil-base paints showed considerable flaking and grain cracking over the same time span on similar buildings. The acrylic superior performance apparently is due to good adherence and film flexibility.

No one paint satisfies all requirements under varying conditions. Therefore, paints have been specialized to produce the best results for particular uses. For example, white paints are self cleaning and free chalking for use where chalk rundown will not mar brick or stone below wood siding, but chalk-resistant where brick or stone is present. Fume-resistant white paints are available for use where industrial or other fumes are present. For warm, humid conditions, mildew-resistant paints help prevent mildew discoloration. Specific paints are available to protect and enhance the beauty of houses sided with shingles or shakes. Exterior trim

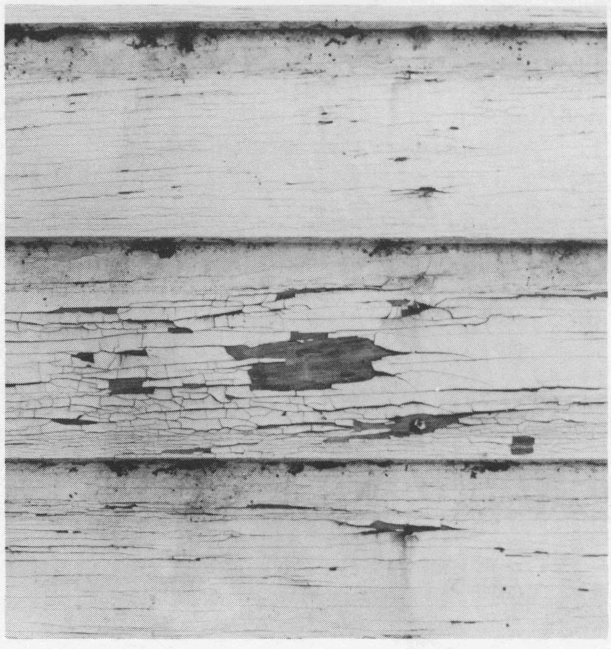

*Figure 1. Oil base paints become brittle with age, and crack and peel easily.*

paints are used primarily for wood trim, screen frames, shutters and other small areas. They are fast drying, have a high gloss, give color and gloss retention, are durable and do not show brush marks. The homeowner should consult a local paint dealer to determine which paint best fits his needs, and which performs best under local conditions.

### How Much Paint?

The amount of paint required depends on the wood condition and the size of the surface area to be painted. New wood (never before painted) requires a primer. For repainting, a primer is needed only when the old paint has blistered or peeled and bare wood is exposed. The primer coat requires about 1 gallon per 450 square feet of surface area, and the finish coat about 1 gallon per 500 square feet. The amount of paint required can be calculated using these figures and the house dimensions:

1. Average height of house = distance from foundation to eaves for flat roof types; add 2 feet for pitched roofs.
2. Average height x distance around foundation = surface area in square feet.
3. $\frac{\text{Surface area}}{450}$ = Number of gallons of primer required.
4. $\frac{\text{Surface area}}{500}$ = Number of gallons of finish paint required for each coat.

### Preparing and Painting New Wood

It is extremely important that exterior wood be finished correctly the first time. Initial mistakes affect later paint applications unless the first finish is completely removed, and this is difficult and expensive.

Reduction of shrinking and swelling should be an initial consideration, particularly if oil-base paint is to be used. Treating wood with a water-repellent preservative (WRP) before painting protects against rain and heavy dew which can cause dimensional changes.

It is preferable to use wood treated with WRP during manufacture. If WRP-treated wood is purchased, freshly cut pieces should be brush or dip treated. Wood not factory treated can be dipped, brushed or sprayed with WRP. Be sure to treat the ends of boards and joints between boards.

If the WRP is brushed or sprayed, allow 2 days of favorable drying weather before painting. If wood is dipped in WRP, allow 1 week of favorable drying weather before painting. The WRP solvent must dry completely or the applied paint may discolor, be slow to dry, or dry with a rough surface.

WRP solutions are available at paint and lumber stores. If not available locally, the following formula from the U. S. Forest Products Laboratory will serve as an effective WRP wood pretreatment.

| Ingredients | Approximate quantity | |
|---|---|---|
| | 1 gal. | 5 gal. |
| Penta concentrate, 10:1 | 1 ¾ cup | 2 quarts |
| Boiled linseed oil | 1 ½ cup | 1 ¾ quarts |
| Paraffin wax | 1 oz. | 5 oz. |
| Solvent (turpentine, mineral spirits or paint thinner) | 3 quarts | 4 gallons |

Melt the paraffin wax in the top unit of a double boiler or some other container heated by hot water. (A direct flame will ignite the paraffin wax.) Slowly pour the melted paraffin into the room-temperature solvent, stirring vigorously while pouring. Then add linseed oil and penta concentrate. Stir until the mixture is uniform.

The primer coat of paint can be applied once the WRP treatment has dried thoroughly. Two coats of finish paint, with proper drying time between applications, will complete the job. This procedure for painting new wood should provide 7 to 10 years of service before repainting is necessary, if quality paint is used. Using more than the three coats of paint specified will not make the finish last longer.

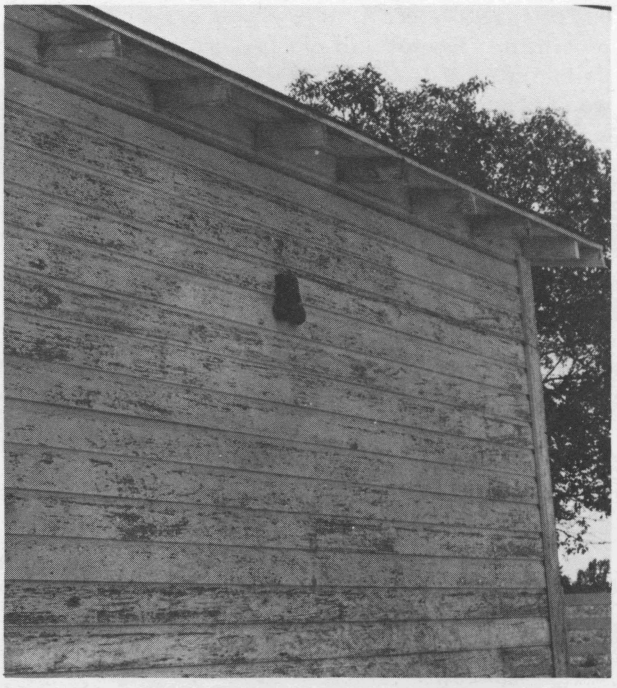

*Figure 2. Paint failures down to the bare wood require removal of all old blisters, cracks or other failures and a subsequent wood treatment with a water-repellent preservative.*

### Preparing Wood for Repainting

Preparation for repainting depends on the condition of the old finish. If the old paint is only faded, dirty and chalking, the surface should be dusted before painting.

If the wood surface is extremely dirty, wash it with a mild detergent and rinse thoroughly with water. Allow the surface to dry completely before painting. Remove rust marks around nail heads with sandpaper or a steel-wire brush and scraper.

If blistering, cracking or "alligatoring" of the old paint is extensive, remove bad areas of the finish down to the bare wood and sand the edges of the sound paint around scraped areas with medium sandpaper. Brush the exposed bare wood with WRP, and allow the solution to dry for 2 days before repainting. Apply primer over the WRP-treated bare wood before putting on the finish coat.

If the old painted surface is in good condition with no flaking, blistering or bare wood exposed, one coat of new paint may suffice. If the old paint is very thin and the wood is beginning to show, two coats should be applied.

Choice of paint type for repainting depends on the original paint used and the condition of the painted surface. If the surface is in good condition, with no flaking, blistering or bare wood exposed, select the same paint type originally used. If an oil-base paint was originally used and extensive failure has occurred, select a more elastic acrylic paint for repainting. Remove all old blisters, cracks or other paint failures down to the bare wood, treat bare wood with WRP, prime WRP-treated areas with acrylic primer, and then apply an acrylic finish coat (Fig. 2). Be sure to read the manufacturer's recommendations for application.

Applications of acrylics over old oil-base paints will not eliminate new paint failures. If the oil-base paint continues to fail, the acrylic attached to it also will fail. Failure areas must be sanded down to the bare wood, treated with WRP, and primed and finished with acrylic paints.

### When to Paint

Apply paint in clear, dry weather, after morning dew has evaporated and the temperature is above 40 degrees F. The wood should be dry. If latex paint is used some moisture can be left on the wood. When the temperature is high, begin painting on a side of the house that has been exposed to sunlight but is now shaded. Then follow the sun around the house, always working in the shade. Late spring and early fall are good times to paint because there are fewer flying insects, which are often attracted to wet paint surfaces.

### Painting Tips

—Mix your paint according to the manufacturer's directions. Always stir the paint thoroughly before applying.

—Always begin painting at the high part of the house and work down, completing the trim work (windows, doors, shutters) last.

—Apply the finish coat generously and brush out.

—Always paint with the grain of the wood, using even brush pressure. Work all the way across the width of the section being painted before starting a new area below. This helps eliminate lap marks in the paint.

—After the primer has thoroughly dried, apply the finish coat promptly. Label directions will give proper drying times for both primer and finish coats.

For additional information on how to apply paint, obtain L-1194, *Painting Your House,* from your local county Extension agent. If you prefer to stain exterior wood, ask for MP-1123, *Staining The Exterior Wood Of Your Home.*

### References


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3. U.S.D.A. "Exterior Painting." Home and Garden Bulletin No. 155, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402 (10 cents).
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